EARLY FELT FROM MOLES.

Lake Dwellers Used the Humble Antmal's Hair to Make Cloth.

One of the interesting finds made by scheologists who investigated the remains of the European lake dwellers. people of prehistoric times that built their huts on piles over bodies of water, was the discovery of small quantities of what appeared to be fine wool cloth. Closer examination disclosed the fact that the fabric was not woven but was felted.

The scientists then began an investigation to discern what sort of an animal it was that furnished the wool which the lake dwellers made into their cloth. A close investigation resulted in the decision that these strange people had made felt from the wool of moles. These small sidered, but could be used for felt.

Felt is a fabric formed without weaving by taking advantage of the tendency of or less notched or jagged on its surface. This is the more apparent when an examination of the material is made by the aid of a microscope. In some animals there appears to be a set of barbs on the hair and these barbs are so placed that the tip of each points to the end of the hair. It follows that when a number of hairs are pressed together those which lie in the opposite direction to each other will interlock with the barbs of the hair surface and resist an effort to tear them asunder. When the hair has a natural tendency to curl the interlacing process which is called

felting is more easily accomplished. Although the felting property is possessed by wool in a special degree, other animals have it in their covering. This is true of the goat, ox, hare, rabbit and beaver.

J. R. Williams, an American, first introduced a mechanical process for felting in 1820. The main principle involved in Mr. Wilniams's device and varied in details in other patents that have been taken out of the patents that have been taken out of the length and breadth of the web to be made. One layer of these laps is placed upon another to secure the desired thickness of the fabric. The sheet is passed between rollers that are partly immersed in water and may be heated by steam. The material is subjected to a beating and oscillatory motion as well as to pressure.

He Built the New Machines University of the length and oscillatory motion as well as to pressure.

Government Count of Sheep.

Government reports show that there are to-day more than 67,000,000 sheep animals have a fine fleece which would be in the United States. Some one has out of the question were spinning con- calculated that if this number were placed in a column, two abreast, they would circle the globe, and still there would be a few left over. To ascertain hair and wool to interlace and cling to the cost of producing this vast amount each other. Antiquarians state that the of wool and mutton, the Government art of felting was developed long before has spent more than a year in investhe weaver was first known. Felting tigation. Whenever the tariff occupies antedates the Christian era by many cen- the stage in politics and Schedule K turies. Authorities state that the felting is talked about, the question of the cost quality of hair or wool results from the natural structure of the material. The topics. So many conflicting views have hair of most animals is noticed to be more been presented on this subject that the or less notched or jagged on its surface. Government has employed Prof. E.

tionized Cotton Spinning.

The history of Samuel Slater, one of the picturesque American pioneers in the textile industry, might be cited as illustrative of the growth of the industry in this country

The foundation period began with the emigration of the youthful Samuel Slater from England in 1789 and ended with his death in 1835. This may be called the romantic epoch of the business, for the story of Samuel Slater is a remarkable series of accomplishments very rarely found in the life of one man. Appren-ticed to Strutt, the associate of the great Arkwright, the lad had mastered Arkwright's inventions which had revolutionized cotton spinning. He had the mechanical instinct and training which permitted him to build the machines imself under what proved to be most adverse conditions. Moreover he knew how the machines should be used for he had a complete working knowledge, of textile manufacturing, acquired in a long and thorough apprenticeship.

Before his industrial service with Strutt had ended he had made up his mind to leave England for the New World. He saw further than most men of his day. He believed that the United States presented a greater field for the then modern textile machinery than did England. At that time cotton manufacturing ion of Derbyshire. The general opinion of those engaged in the business was voiced in an interview between Samuel

ticeship he asked Mr. Strutt whether he considered it a permanent business. The elder man replied, "It is not probable, Samuel, that it will always be as good as it is now, but I have no doubt it will always be a fair business if it well man-This was not so conservative an opinion as it appears to one looking back from the present day, for Peel had not then invented the printing cylinder. Naturally the boy was influenced by the prevailing estimate of conditions, and when he read the advertisement of an American society, published in a Philaelphia newspaper, offering a reward or the invention of textile machinery. o accomplish what Arkwright had done. ne determined that the United States presented to the inventor who was well rounded in his knowledge a virgin soil which would produce most profitable harvests. Apparently he dared tell no one his plans. Certainly neither his mother nor his brothers learned of his intention until he was on the ocean.

its industries with a most jealous care The sting of the revolution still smarted. No skilled mechanic was permitted to sold abroad. No person could take passage for the United States without being severe punishment awaited one who attempted to smuggle knowledge in a tangible form across the Atlantic.

When he reached America he soon formed the acquaintance of Moses Brown embodying the Arkwright inventions Previously some attempts had been made by Americans to build jennies and billies

process.

In 1815 in response to a public demand Samuel Slater's genius was again put to work, and he erected at Webster the first woollen mill in America, soon to begin the manufacture of uniform cloths. At an early date the United States called upon him to supply this cloth for the army and navy, and to the present day a uniform seen in America can usuelly trace back its history to the first Slater woollen mill. Mr. Slater operated the Webster mills

SAMUEL SLATER, A

TEXTILE PIONEER

I Came to America in 1789 With His

Head Full of Arkwright's

New Inventions.

Textile Ploneer

New Inventions.

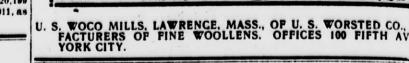
I Built the New Machines Under the Greatest Handicaps and Revolutionized Cotton Spinning.

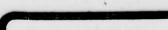
Almost to the day of his death. From that time they were dominated by the first herist of a translated by the Boston and Albany Railroad the firm by his father in 1829. Six years later he assumed what was substantially titted to take up the work where his father herit in 1888, he managed the business, developing it with rapidity and solidity.

Horatio N. Slater was a remarkable ment in 1889, he managed the business, developing it with rapidity and solidity to direct the marketing of an of machine used in his mills. He expension of the industry, its establishment on staple lines and the formation of the plan which with slight modifications has since been adhered to.

A Big Export Gain of 1911.

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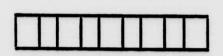


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development of the mercerizing process for cotton thread and yarns and in adapting the process to the demands of the wholesale trade. It is claimed that the mercerization of fabrics has become one of the world's leading industries, and more especially in the manufacture of hosiery In the latter industry the mercerized articles have found equal favor with silk. this fact being due to the better wearing qualities of mercerized cotton over the silk hoisery. Mercerized yarns are also being used in the manufacture of underwear as well as in other ways new to the cotton trade. One of these new uses is in the making

of embroidery. Just now embroideries and laces form an important part of milady's wardrobe. The yarns are being used extensively for backing in silks, for The English Government was guarding | mufflers, neckties, scarfs and other articles of a similar nature. Forstitching of spiked rollers, which complete the dispurposes mercerized threads have largely displaced silk not only for home use but in the manufacture of clothing, shoes, lrats, gioves, leather goods and other submitted to a thorough search, and articles where large quantities of stitching threads are used. It would be possible to go on with a much longer list of the uses found for this thread.

Mercerizing gets its name from John of Providence, who was the founder of Mercer, a Lancashire calico printer who Brown University. A year later he was discovered the process in 1844. This reagents, such as caustic soda, that re-Previously some attempts had been made by Americans to build jennies and billies for the spinning of cotton, but none had been successful. The yarns could not be worken to hear successful. The yarns could not be worken to hear successful. The yarns could not be worken to hear successful. The yarns could not be worken by hand in households. In 1810, twenty years after Stater's spindles were set to work at Pawtucket, more than a hundred cotton mills were in operation. All constructed after his models. In the sparse population one of the chief difficulties of the early manufactures was in procuring operators or help. The mills succeeding Slater's were located further in the interior; on this account Mr. Slater was obliged to seek families and induce them to emigrate to Pawtucket. He found one Arnold with a family of ten or eleven living near a small village in a rade cubin chieffy made of slate and with a chimney of stone. The interior copes shows that the cotton has family of ten or eleven living near a small village in a rade cubin chieffy made or slate and with a chimney of stone. The heart proposed in the fibre of these hardy people. Mrs. Annold appreciated it fully, for when her husband consulted her on the proposed change she insisted that Mr. Slater should give them as good a house as their old one. The wages paid these operators ranged from so cents to \$1.30 and \$14.04 a week.

Pawtucket contained then not more than a dozen houses. There was no school.

From 80 cents to \$1.30 and \$1.40 a week.

Pawtucket contained then not more than a dozen houses. There was no school and no church. Mr. Slater introduced the English apprentice system, but it did not suit the American temperament and was abandoned. One lad found the pressure hard and Mr. Slater too strict. He combard and Mr. Slater too strict. He combard and Mr. Slater too strict. He combard and otton or silk and cotton or silk and cotton. Binding threads are introduced in the manufacture of such goods and then the piece is passed through cold caustic sods, washed, subjected to dilute sulphuric acid and washed out a product similar to that of the card-

is adviser, "act like the devil and Slater will let you off." act like the devil and slater will let you off. "act like the devil and slater will let you off." act like the devil and slater will let you off. "act like the devil and slater will let you off." act like the devil and slater will let you off. "act like the devil and slater will act let you off." act like the devil and slater will act let you off. "act like the devil and slater will let you off." act like the devil and slater will let you off. "act like the devil and slater will let you off." act like the devil and slater will let you off. "act like the devil and slater will let you off." act like the devil and slater will let you off. "act like the devil and slater will let you off." act like the devil and slater will let you off. "act like the devil and slater will let you off." act like the devil and shad loom promess. The slate to the mill. The first 13:000 pounds of the mill. The first 13:000 pounds of cotton carded at Pawtucket was picked by hand. The yarms manufacturers and returned to the mill. The first twisting of the slicested puckered effect. Another application of this process was also were so made up in warps, were sold to farmers and others to be taken to their homes and woven for themselves in colors of the first twisting of the manufacturers and returned to them in cloth. To obtain this yarn was deemed a favor by the women of the families. As the weaking has been continued for as the weaking has been continued for as where the washing has been continued for as where the washing has been continued for as which will be the work of three-fourths wide, plain cloth; six cents for four-fourths wide, plain cloth; six cents for four-fourths wide, bedticks, and 12½ cents for four-fourths wide, bedticks, and 12½

lateel rollers on which the hanks of cotton are placed and spread out evenly. The bearings of the upper roller run in a slotted groove. After the soda has been applied the upper roller is revolved and the hanks acting as a belt causes the lower roller to simultaneously move. The Process of Mercerizing Has Three minutes is the time given for this treatment, after which the hanks are washed until their tension slackens and then they are treated with dilute sulphuric acid and waghed again.

Bleaching follows, and the yarn may be subsequently dyed in the ordinary way. Cotton in the piece is mercerized by in England was confined to a small sec- Material Is Passed Back and more expensive apparatus because it is necessary to prevent contraction in both length and breadth. It has been found that when cotton is mercerized under tension it does not take color so well as when it is mercerized in the slack condition. Why cotton should be made lustrous by this process has not been completely explained by experts and various views have been expressed on the sub-The thread from which these mercer-

> ized fabrics are made is the product of complicated but nearly perfect machinery. The raw material must pass through a maze of rollers, toothed wheels and spindlelike contrivances. As the bales of ginned cotton are received at the mills they are usually dense masses that have been packed by hydraulic pressure. The bale breaker takes these compact bundles and disentagles them. One machine for doing this work consists of theee pairs of spiked rollers and one fluted pair, the cotton being fed between the first spiked pair and gripped and pulled apart by the second pair, revolving at a higher velocity. It is then passed to the third pair entangling process and deliver the cotton to the fluted rollers, by which it is expelled from the machine. A travelling latticework conveyor takes the cotton to the mixing room.

To clean the cotton thoroughly it is subjected to the influence of a beater, another machine made up of rollers and teeth. It is passed back and forth from one set of rollers to another until all dirt sults in bringing about chemical changes of air and deposited upon the surfaces

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